

1 CLAIMS

2 1. A computer-implemented method comprising the following steps:  
3 creating a license pack at a license generator, the license pack containing a  
4 set of one or more individual software licenses;  
5 signing the license pack with a digital signature of the license generator;  
6 issuing the license pack to a license server;  
7 verifying, at the license server, the license generator's digital signature on  
8 the license pack; and  
9 distributing the software licenses contained in the license pack from the  
10 license server to corresponding clients.

11  
12 2. A computer-implemented method as recited in claim 1, further  
13 comprising the step of creating a license pack containing a predefined number of  
14 software licenses.

15  
16 3. A computer-implemented method as recited in claim 1, further  
17 comprising the following steps:  
18 creating a license pack ID at the license generator; and  
19 evaluating the license pack ID at the license server.

20  
21 4. A computer-implemented method as recited in claim 1, further  
22 comprising the following steps:  
23 encrypting the license pack at the license generator; and  
24 decrypting the license pack at the license server.  
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1 5. A computer-implemented method as recited in claim 1, further  
2 comprising the step of creating a license pack that is tailored to a particular  
3 operating platform of the clients.  
4

5 6. A computer-implemented method as recited in claim 1, further  
6 comprising the step of determining an authenticity of an individual client prior to  
7 distributing the software license to that individual client.  
8

9 7. A computer-implemented method as recited in claim 1, further  
10 comprising the following steps:

11 determining whether an individual client has a non-expired license;

12 in the event that the client has a non-expired license, forwarding the non-  
13 expired license to the individual client; and

14 in the event that the client does not have a non-expired license, granting one  
15 of the software licenses from the license pack.  
16

17 8. A computer-implemented method as recited in claim 7, further  
18 comprising the step of encrypting said one software license using a public key of  
19 the individual client.  
20

21 9. A computer-implemented method as recited in claim 1, further  
22 comprising the step of evaluating whether an individual client already has a  
23 software license that has not yet expired.  
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Sub A3  
10. A computer-implemented method as recited in claim 1, wherein the license pack has a license pack ID, and further comprising the step of granting additional licenses for the license pack having the same license pack ID.

11. A computer-implemented method as recited in claim 1, further comprising the following steps:

submitting an old software license from one of the clients to the license server, the old software license containing a license ID;

determining whether an upgrade software license is available for the license ID;

granting the upgrade software license if available to the one client; and replacing, at the one client, the old software license with the upgrade software license.

12. A computer-implemented method as recited in claim 1, further comprising the step of distributing a temporary license of in an event that no more licenses are available from the license pack.

Sub A4  
13. A computer-implemented method for distributing software licenses to clients so that the clients may legally execute underlying software to which the software licenses pertain, the computer-implemented method comprising the step of electronically issuing the software licenses as digital certificates that can be distributed in one-to-one correlation with individual clients and traced to an issuing authority.

1 14. A computer-readable medium having computer readable instructions  
2 for performing the step as recited in claim 13.

3  
4 15. A computer-implemented method comprising the following steps:  
5 receiving a request for a software license from a particular license server;  
6 creating a license pack containing a set of one or more individual software  
7 licenses;  
8 assigning a license pack ID to the license pack;  
9 associating the license pack ID with the particular license server;  
10 digitally signing the license pack; and  
11 issuing the signed license pack to the particular license server.  
12

13 16. A computer-implemented method as recited in claim 15, further  
14 comprising the step of creating a license pack containing a predefined number of  
15 software licenses.  
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17 17. A computer-implemented method as recited in claim 15, further  
18 comprising the step of creating a license pack that includes a platform type  
19 indicating a type of operating platform for which the software licenses can be used.  
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1 18. A computer-implemented method as recited in claim 15, further  
2 comprising the step of creating a license pack that includes a predefined number of  
3 software licenses, a platform type indicating a type of operating platform for which  
4 the software licenses can be used, an expiration date indicating a date on which the  
5 software licenses will expire, and a product ID that identifies a product with which  
6 the software licenses can be used.

7  
8 19. A computer-implemented method as recited in claim 15, further  
9 comprising the step of encrypting the license pack.

10  
11 20. A computer-readable medium having computer readable instructions  
12 for performing the steps as recited in claim 15.

13  
14 21. A computer-implemented method comprising the following steps:  
15 receiving a request for a software license from a particular client;  
16 determining an authenticity of the particular client;  
17 selecting a software license from a pack of software licenses that is  
18 appropriate for the particular client, the software license having an associated  
19 license ID;  
20 associating the license ID with the particular client, and  
21 granting the software license to the particular client.  
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1 22. A computer-implemented method as recited in claim 21, further  
2 comprising the step of determining whether the particular client already has a non-  
3 expired license, and if so, forwarding the non-expired license to the particular  
4 client rather than granting the software license.

5  
6 23. A computer-implemented method as recited in claim 21, further  
7 comprising the step of granting the software license as containing the license ID, a  
8 platform type indicating a type the platform, an issue date indicates a date on  
9 which the license is issued to the client, an expiration date that indicates a date on  
10 which the software license will expire, a product ID that identifies a product with  
11 which the software licenses can be used, a client ID that identifies the particular  
12 client, and a version of the software license.

13  
14 24. A computer-implemented method as recited in claim 21, wherein the  
15 step of determining the authenticity comprises the following steps:  
16 receiving a client software ID from the particular client; and  
17 evaluating the client software ID to determine whether the client is  
18 authentic.

19  
20 25. A computer-implemented method as recited in claim 21, wherein the  
21 step of determining the authenticity comprises the following steps:  
22 maintaining a set of client images;  
23 receiving a client software ID from the particular client; and  
24 comparing the client software ID to the client images to evaluate whether  
25 the client is authentic.

1  
2 26. A computer-implemented method as recited in claim 21, further  
3 comprising the following steps:

4 determining a platform of the particular client; and

5 selecting the software license as is appropriate for the platform of the  
6 particular client.

7  
8 27. A computer-implemented method as recited in claim 21, further  
9 comprising the step of encrypting the software license using a public key of the  
10 particular client.

11  
12 28. A computer-implemented method as recited in claim 21, further  
13 comprising the step of granting a temporary software license that expires in a  
14 substantially shorter duration in comparison to the software license.

15  
16 29. A computer-readable medium having computer readable instructions  
17 for performing the steps as recited in claim 21.

18  
19 30. A computer-implemented method comprising the following steps:  
20 computing a value as a one-way function of a client executable image that  
21 uniquely identifies a client; and

22 digitally signing the value using a private signing key of a server that serves  
23 the client to create a client image digital signature that is unique to the client.  
24  
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1           31. A computer-implemented method as recited in claim 30, wherein the  
2 computing step comprises the step of hashing the executable image to produce a  
3 hash value.

4  
5           32. A computer-implemented method as recited in claim 30, further  
6 comprising the step of storing the client image digital signature at the client.

7  
8           33. A computer-implemented method as recited in claim 30, further  
9 comprising the following steps:

10           storing the client executable image at the server;

11           storing the client image digital signature at the client;

12           submitting the client image digital signature from the client to the server  
13 when requesting a software license; and

14           evaluating an authenticity of the client based on the client image digital  
15 signature prior to granting a software license to the client

16  
17           34. A computer-implemented method as recited in claim 33, wherein the  
18 evaluating step comprises the following steps:

19           unsigning the client image digital signature using a public key of the server  
20 to recover the client executable image; and

21           comparing the recovered client executable image to the client executable  
22 image stored at the server.



1 35. A computer-implemented method as recited in claim 34, further  
2 comprising the step of rejecting the request for a software license in an event that  
3 the recovered client executable image does not match the client executable image  
4 stored at the server.

5  
6 36. A computer-readable medium having computer readable instructions  
7 for performing the steps as recited in claim 30.

8  
9 37. A computer-implemented method comprising the following steps:  
10 receiving a request for a software license from a client having a valid client  
11 image;  
12 submitting a challenge to the client, the challenge comprising a random  
13 number;  
14 computing, at the client, a function of the challenge and the client image to  
15 produce a response;  
16 returning the response to the server;  
17 deriving the client image from the response at the server; and  
18 verifying the client image at the server prior to granting the software  
19 license.

20  
21 38. A computer-implemented method as recited in claim 37, wherein the  
22 computing step comprises the following steps:  
23 concatenating the random number and the client image to produce a  
24 concatenated value; and  
25 computing a hash function of the concatenated value.

1  
2 39. A computer-implemented method as recited in claim 37, further  
3 comprising the step of rejecting the request for the software license in the event  
4 that the client image cannot be verified.

5  
6 40. A computer-implemented method as recited in claim 37, further  
7 comprising the step of establishing a trust with the client and subsequently  
8 granting the software license in the event that the client image can be verified.

9  
10 41. Computer-readable media distributed at the server and the client  
11 having computer readable instructions for performing the steps as recited in claim  
12 37.

13  
14 42. A computer-implemented method comprising the following steps:  
15 submitting an old software license from a client to a server, the old software  
16 license containing a license ID;  
17 determining whether an upgrade software license is available for the license  
18 ID;  
19 granting the upgrade software license, if available, to the client; and  
20 replacing, at the client, the old software license with the upgrade software  
21 license.

1 43. A computer-implemented method as recited in claim 42, further  
2 comprising the step of tracking at the server that the upgrade software license is  
3 granted to the client.

4  
5 44. Computer-readable media distributed at the server and the client  
6 having computer readable instructions for performing the steps as recited in claim  
7 42.

8  
9 45. A system for licensing software, comprising:  
10 a license generator to create a license pack containing a set of one or more  
11 individual software licenses, the license generator digitally signing the license  
12 pack with a digital signature; and  
13 a license server remote from, but operatively coupled to, the license  
14 generator to receive the license pack from the license generator, the license server  
15 verifying the license generator's digital signature on the license pack and storing  
16 the individual licenses for subsequent distribution to individual clients.

17  
18 46. A system as recited in claim 45, wherein the license generator  
19 assigns a license pack ID to the license pack and associates the license pack ID  
20 with the license server.

21  
22 47. A system as recited in claim 45, wherein the license generator  
23 encrypts the license pack using a public key of the license server.

48. A system as recited in claim 45, wherein the license pack contains a preset number of software licenses.

49. A system as recited in claim 45, wherein the license pack identifies a type of operating platform for which the software licenses can be used.

50. A system as recited in claim 45, wherein the license pack comprises at least one of the following items:

a predefined number of software licenses;

a platform type indicating a type of operating platform for which the software licenses can be used

an expiration date that indicates a date on which the software licenses will expire; and

a product ID that identifies a product with which the software licenses can be used.

51. A system as recited in claim 45, wherein the license server selects a software license from the license pack and grants the software license to a client, the software license having a license ID and the license server associating the license ID with the client.

52. A system as recited in claim 45, wherein the license server challenges an authenticity of a client prior to granting a software license from the license pack to the client.

1 **53.** A system as recited in claim 45, wherein the license server grants a  
2 software license server to a particular client, the license server encrypting the  
3 software license using a public key of the particular client.  
4

5 **54.** A system as recited in claim 45, wherein the license server  
6 distributes the software licenses to the individual clients via one or more  
7 intermediate servers.  
8

9 **55.** A license generator for issuing packs of software licenses to  
10 authorized license servers, comprising:

11 a request handler to receive a request from a license server for a license  
12 pack;

13 a license producer responsive to the request received by the request handler  
14 to generate a license pack containing a set of one or more individual software  
15 licenses; and

16 the license producer assigning a license pack ID to the license pack,  
17 associating the license pack ID with the license server, and digitally signing the  
18 license pack.  
19

20 **56.** A license generator as recited in claim 55, wherein the license pack  
21 contains a predefined number of software licenses, a platform type indicating a  
22 type of operating platform for which the software licenses can be used, an  
23 expiration date that indicates a date on which the software licenses will expire, and  
24 a product ID that identifies a product with which the software licenses can be used.  
25

1 *Sub B1* 57. A license generator as recited in claim 55, wherein the license  
2 producer encrypts the license pack using a public key of the license server.

3  
4 58. A license generator as recited in claim 55, further comprising a  
5 master license database, the license producer storing the license pack ID in  
6 correlation with an ID of the license server in the master license database.

7  
8 *Sub B1* 59. A program embodied on a computer-readable medium, comprising:  
9 a code segment to create a license pack containing a set of one or more  
10 individual software licenses;  
11 a code segment to assign a license pack ID to the license pack;  
12 a code segment to associate the license pack ID with the particular license  
13 server; and  
14 a code segment to digitally sign the license pack.

15  
16 60. A license server for issuing individual software licenses from a  
17 software pack received from a licensing clearinghouse, comprising:  
18 a license store to store the software pack of individual software licenses,  
19 each software license having an associated license ID;  
20 a request handler to receive a request for a software license from a client;  
21 a client authenticating module to determine whether the client is authentic  
22 and can receive a software license; and  
23 a granting module to grant a software license from the license store to an  
24 authenticated client and to associate the license ID with the authenticated client.  
25

61. A license server as recited in claim 60, wherein the authenticating module determines an operating platform of the client.

62. A license server as recited in claim 60, further comprising:  
a client image cache to store a set of client images; and  
the client authenticating module receives a client image from the client and compares the received client image to the set of client images to evaluate whether the client is authentic.

63. A license server as recited in claim 60, wherein the granting module encrypts the software license using a public key of the authenticated client.

64. A license server as recited in claim 60, wherein the software license contains at least one of the following items:

- a version indicator of a software license;
- a license ID;
- a client ID that identifies the authenticated client;
- an issue date on which the license is issued to the client;
- a platform type of the client's operating platform for which the software license can be used;
- an expiration date on which the software license will expire; and
- a product ID that identifies a product with which the software licenses can be used.

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65. A license server as recited in claim 60, further comprising a license  
pack table to store information pertaining to the license pack that is stored in the  
license store.

66. A license server as recited in claim 60, further comprising a client  
assignment table containing a list of the software licenses that are granted to  
clients.

67. A license server as recited in claim 66, wherein the granting module  
upgrades the client assignment table after granting the software license to the  
authenticated client.

68. A program embodied on a computer-readable medium, comprising:  
a code segment to receive a license pack from a license generator, the  
license pack containing a set of one or more individual software licenses;  
a code segment to validate the license pack;  
a code segment to store the software licenses;  
a code segment, responsive to a request for a software license from a client,  
to determine whether the client is authentic and can receive a software license;  
a code segment to grant a software license to an authenticated client, the  
software license containing a license ID; and  
a code segment to associate the license ID with the authenticated client.

69. A client computer, comprising:  
a license cache to store one or more software licenses;



1 a license requestor to request a software license from a license server;  
2 a challenge handler to handle an authenticity challenge from the license  
3 server, the challenge handler computing a challenge response that contains a client  
4 image that can be used by the license server to evaluate whether the client is  
5 authentic and can be licensed; and  
6 whereupon authentication by the license server and granting of a software  
7 license, the license requestor receiving the software license from the license server  
8 and storing the software license in the license cache.

9  
10 70. A client computer as recited in claim 69, wherein the challenge  
11 contains a random number, and the challenger handler computes the challenge  
12 response by concatenating the random number with the client image to form a  
13 concatenated value and hashing the concatenated value.

14  
15 71. A program embodied on a computer-readable medium, comprising:  
16 a code segment to receive an authenticity challenge from a license server  
17 that distributes software licenses;  
18 a code segment to compute a challenge response that contains a client  
19 image that can be used by the license server to evaluate whether the client is  
20 authentic and can be licensed; and  
21 a code segment to store the software license granted by the license server in  
22 an event that the client is deemed authentic.  
23  
24  
25

1 72. A data structure embodied on a computer-readable media,  
2 comprising:

3 a license pack table to record information pertaining to one or more license  
4 packs, the license pack table being indexed by license pack IDs that identify  
5 corresponding individual license packs, each license pack containing one or more  
6 software licenses;

7 a client assignment table to record information pertaining to software  
8 licenses that are assigned to clients, the client assignment table being indexed by  
9 license IDs that identify individual software licenses, the client assignment table  
10 further having the license pack IDs of the license packs from which the  
11 corresponding software licenses are issued; and

12 the license pack table and the client assignment table being correlated via  
13 the license pack IDs contained in each table.

14  
15 73. A data structure as recited in claim 72, wherein the license pack  
16 table contains the following table fields:

17 a license pack ID field to hold the license pack ID;

18 a quantity field to hold a number representative of how many software  
19 licenses are contained in the license pack;

20 a platform type field to hold a type of operating platform for which the  
21 software licenses in the license pack can be used;

22 an expiration date field to hold a date on which the software licenses in the  
23 license pack will expire; and

24 a product ID field to hold a product ID that identifies a product with which  
25 the software licenses in the license pack can be used.

74. A data structure as recited in claim 73, wherein the license pack table also contains a number assigned field to hold a number representative of how many of the software licenses have been assigned to clients.

75. A data structure as recited in claim 72, wherein the client assignment table contains the following table fields:

a license ID field to hold the license ID;

a license pack ID field to hold the license pack ID;

a client ID to hold an identifier of a client to which the software license is granted; and

an issue date to hold a date on which the software license is issued to the client.

76. A license pack data structure embodied on a computer-readable media comprising:

a license pack ID field to hold an identifier for an associated license pack that contains software licenses to be individually granted to individual computers;

a quantity field to hold a number representative of how many software licenses are contained in the license pack;

a begin serial number to hold a beginning serial number of the software licenses contained in the license pack;

an expiration date field to hold a date on which the software licenses will expire; and

1 a product data field to hold data regarding the product with which the  
2 software licenses can be used.

3  
4 ~~Sub B1~~ 77. A license data structure embodied on a computer-readable media  
5 comprising:

6 a version field to hold a version indicator of a software license;  
7 a license ID field to hold an identifier for the software license;  
8 a client ID to hold an identifier of a client to which the software license is  
9 granted;

10 an issue date to hold a date on which the license is issued to the client;  
11 an expiration date field to hold a date on which the software license will  
12 expire; and

13 a product data field to hold data regarding the product with which the  
14 software licenses can be used.

15  
16 78. A license data structure as recited in claim 77, further comprising a  
17 description field to hold a written description of the software license.

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19 Add  
20 B1  
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